

RE-ESTABLISHMENT OF ANGELICA CALIFORNICA (UMBELLIFERAE)

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ABSTRACT

Angelica californica Jepson emend. DiTomaso, previously included within *Angelica tomentosa* Watson, is re-established as a distinct species from the Sierra Nevada foothills and the Coast Ranges of northern California. Illustrations, a distribution map, and several distinguishing characters are provided.

Nine species of *Angelica* are believed to occur in California, the eight recognized by Munz (1959) and the recently described *A. callii* Math. & Const. (1977). Four of these are found along the Sierra Nevada-Cascades axis from Shasta County to Tulare County. The remainder occur in the western, coastal portion of the state from Siskiyou and Del Norte Counties to San Diego County.

Jepson (1893) described *Angelica californica* on the basis of a single collection from the Vaca Mountains of Solano County and noted its similarity to *Angelica tomentosa* Watson. In 1901, Jepson emended his treatment and demoted *A. californica* to a variety of *A. tomentosa*. Since that time, there has been a great deal of confusion about the identity of coastal foothill *Angelica*. As in *A. arguta* Nutt. ex Torrey & Gray, the ovaries of *A. californica* are glabrous, or nearly so, in contrast to the densely pubescent ovaries of *A. tomentosa*. Based on this character, specimens of *A. californica* sensu Jepson key to *A. arguta* in Munz (1959). However, most herbarium sheets of *A. californica* have been annotated as *A. tomentosa*, presumably because *A. arguta* is a more northern taxon.

After visiting many populations and studying numerous herbarium specimens, I have found several additional differences between *A. tomentosa* and *A. californica* (Table 1). Judged on the basis of these criteria, *A. californica* extends as far north as Shasta County and as far east as Butte and Tehama Counties (Fig. 1). Jepson's (1893) description of *A. californica* was not only incomplete with respect to important morphological characters, but it also failed to indicate the range of variability within the species. The present study more accurately describes *A. californica*, defines its range, and proposes its re-establishment as a distinct species.

ANGELICA CALIFORNICA Jepson emend. DiTomaso.—*Angelica californica* Jepson, Erythraea 1:8. 1893. *Angelica tomentosa* S. Wats. var. *californica* Jepson, Fl. W. Middle Calif. 356. 1901.

TABLE 1. CONTRASTING CHARACTERS OF *Angelica californica* AND *A. tomentosa*.

Character	<i>A. californica</i>	<i>A. tomentosa</i>
Umbel shape in mature fruit	Flat-topped or bowl-shaped	Spherical
Ray orientation	Ascending	Spreading
Fruit pubescence	Glabrous (pubescent in Tehama Co.)	Scabrous to tomentose (glabrous in Siskiyou Co.)
Leaflet color	Abaxial surface light green; adaxial surface green	Both adaxial and abaxial surfaces glaucous
Leaflet length/width ratio	2:1 to slightly less	Usually 3:1, occasionally 2:1 or 5:1
Oil tubes (vittae)		
Interval	1-3	1 (rarely 2)
Commissure	2-6	2 (occasionally 4)
Total vittae	6-20	6 (occasionally 8 or 10)
Soil type	Sandstone, shale, or volcanic	Usually serpentine
Flowering time	May to early July	July to October

Plants stout, 1-2.5 m tall, the stem and foliage glabrous to pubescent, strongly scented; leaves deltoid, bipinnate to three times pinnately divided, to 12 dm in length, 8 dm in width; leaflets lanceolate to ovate or oval, (2-)4-8(-14) cm long, (1-)2-4(-8) cm broad, acute to obtuse, the larger petiolulate and with 1 or 2 narrow lobes or leaflets at base, the others sessile, length/width ratio 2:1 or less, excluding petiolule, sharply serrate, the teeth acute to acuminate, irregularly spaced, the abaxial surface glabrous to pubescent and slightly lighter in color than adaxial surface, both surfaces scabrous on veins; petiole stout, 1-6 dm long, sheathing at base; cauline leaves reduced upward, pinnate, the uppermost sheaths bladeless; inflorescence usually glabrous, the umbels flat-topped in flower, becoming concave and bowl-shaped in fruit; involucre wanting, or rarely present; rays 15-50, 2-13 cm long, usually glabrous, or occasionally hispidulous at base and apex, ascending or curved upward, unequal, usually webbed; involucre of 1-10 inconspicuous filiform bractlets, or lacking; pedicels 1-15 mm long, spreading-ascending, usually glabrous, occasionally webbed; flowers white or rarely pinkish, the petals oval to obovate, glabrous to sparsely puberulent or rarely pubescent; styles slender, much longer than the conical stylopodium; ovaries glabrous, or rarely pubescent; fruit green to purple, oval to oblong, 6-7(-10) mm long, 4-6(-7) mm broad, the dorsal ribs low, rounded, the lateral ribs broader than the dorsal but narrower than to equal to the body; vittae irregular in size and variable in number (6-20), 1-3 under the intervals, often appearing continuous about the seed, 2-6 on commissure (Fig. 2).

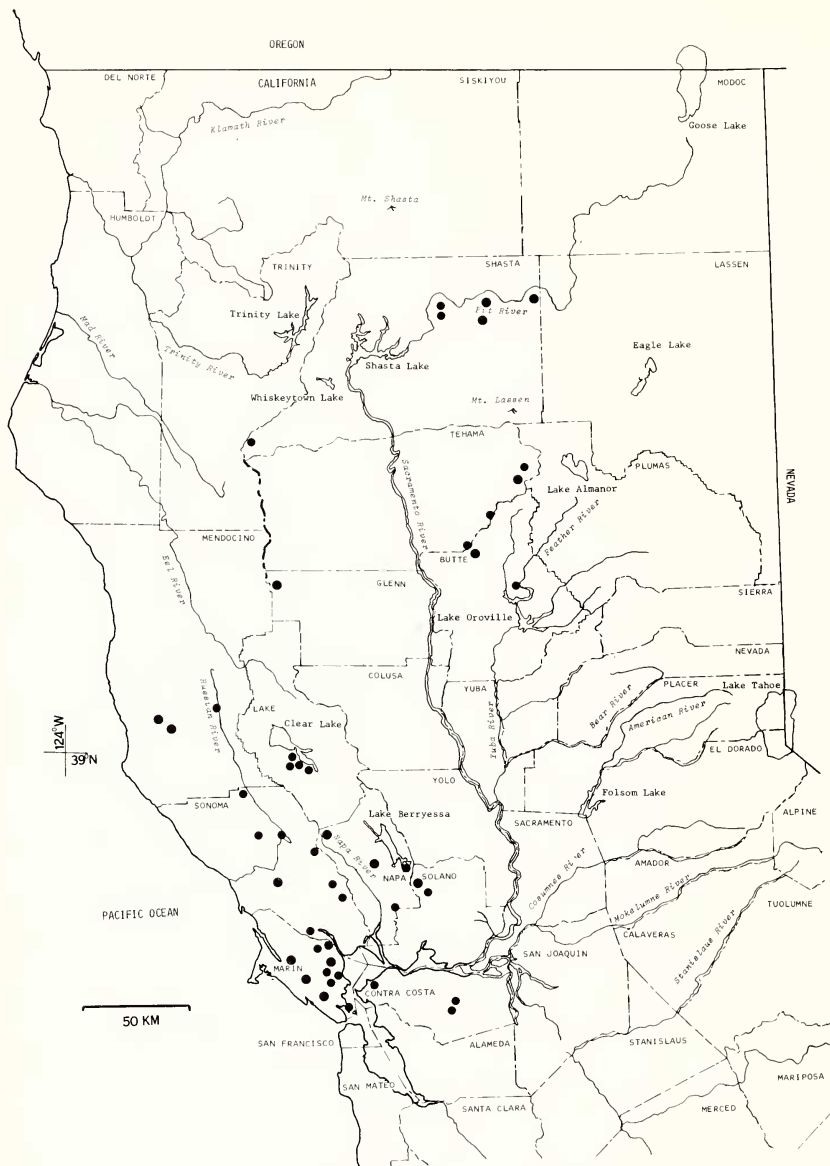


FIG. 1. Distribution of *Angelica californica*.

TYPE: USA, CA, Solano Co.: Gates Cañon, Vaca Mountains, 20 June 1892, *W. L. Jepson* 14246 (Holotype: JEPS!. Topotype: *Di Tomaso* 1744, HSC).

Habitat and Distribution. Dry volcanic, shale, or sandstone slopes

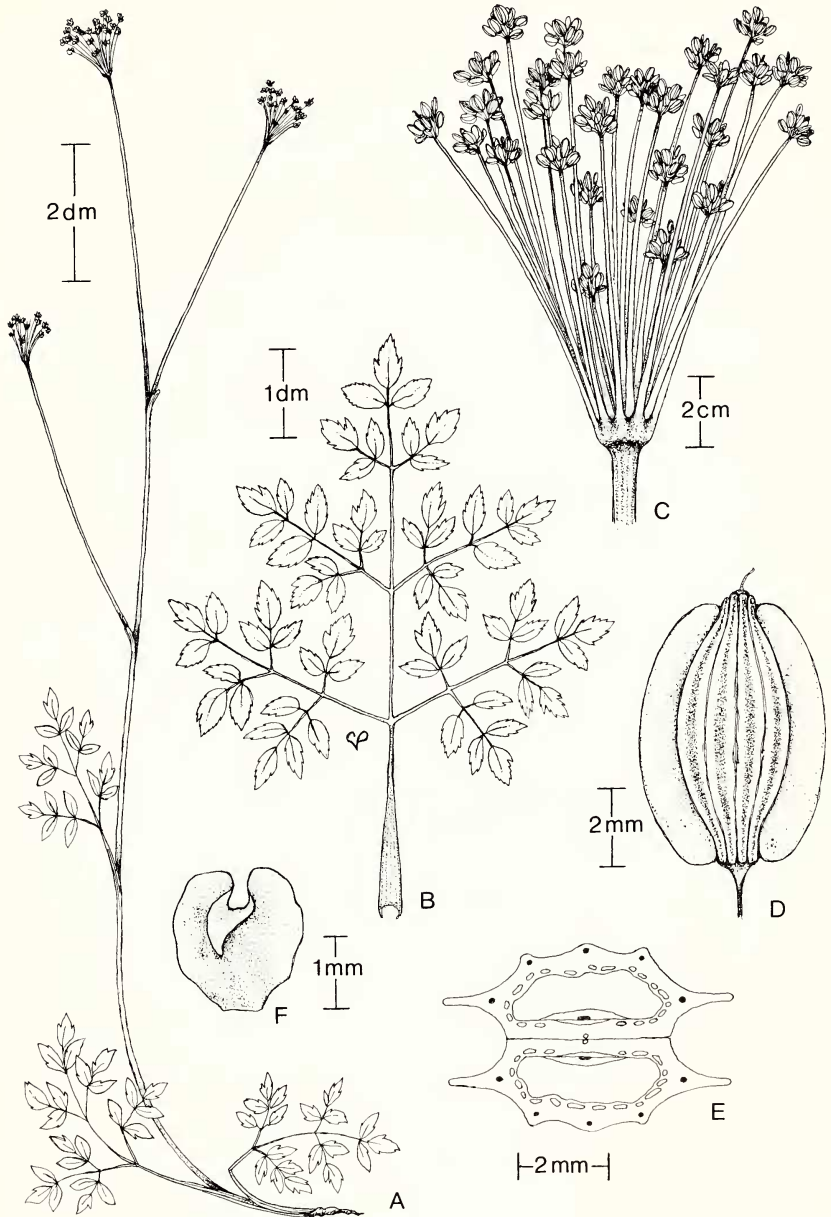


FIG. 2. *Angelica californica*. A, habit. B, basal leaf. C, mature inflorescence. D, dorsal view of entire fruit. E, transection of fruit. F, petal. All from DiTomaso 1595, 1732, and 1736.

between 20 and 1600 m, from Shasta County to Butte County in the foothills of the Sierra Nevada and to Contra Costa County in the Coast Ranges.

Jepson's description of *A. californica* states that "the leaflets are always smaller and usually much thinner" than in *A. tomentosa*. In addition, he notes that *A. tomentosa* is "hoary-tomentose, has equal rays, and solitary depressed oil-tubes in the intervals", as compared to "3 oil-tubes in the intervals" of *A. californica*. It is puzzling that Jepson neglected to consider ovary pubescence, ray orientation, and glaucousness of leaflets in his comparison of the two taxa. I have found these characters to be very effective in separating *A. californica* and *A. tomentosa* in the field. However, several of the important field characters, e.g., glaucousness, ray orientation, umbel shape, and orientation of the mature fruiting stem, are not always evident in herbarium material. This, and the presumed restriction of *A. californica* to the Vaca Mountains, may have contributed to Jepson's later decision, in 1901, and that of Mathias and Constance (1944-45) to include *A. californica* in *A. tomentosa*.

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